

Chapter 2: It's Alive !!! Or is it?

2.1 Characteristics of living things

I. Living Things have cells

A. Cell - a membrane-covered structure that contains all the materials necessary for life

1. Most cells are too small to be seen with the naked eye

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2. Cells are the smallest unit that can perform all life processes: cells are covered by a membrane and have DNA and cytoplasm

3. Different parts of the cell have different functions

→ Figure 1 (Monkeys and Protists)

II Living Things Sense and Respond to Change

A. Stimulus (stimuli) - can be chemicals, gravity, sounds, hunger, or (anything that causes organisms to respond in some way)

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B. Homeostasis — the maintenance of a stable internal environment

1. example: You sweat when you are hot, this is your body's attempt to cool you down in order to maintain homeostasis

C. Responding to External Change
(The external environment causes your body to react and adjust to those conditions)

D. Living Things Reproduce

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1. Sexual Reproduction: reproduction in which the sex cells from two parents unite, producing that share traits from both parents

2. Asexual Reproduction: reproduction that does not involve the union of sex cells and in which one parent produces offspring identical to itself
example: hydra

E. Living things have DNA (deoxyribonucleic acid)

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1. the cells of all living things contain deoxyribonucleic acid, DNA
 2. the passing of traits from one generation to the next is heredity
- F. Living things use Energy
1. Organisms use energy to carry out the activities of life
 2. Metabolism - is the total of all the chemical activities an organism performs

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- G. Living Things Grow and Develop
1. All living things whether they are made of one or many cells, during periods of their life

2.2 The Necessities of Life

I. H_2O (Water)

A. Your cells are made of 70% H_2O

B. Organisms differ greatly on how much water they need

II Air - air is a mixture of gases including oxygen and Carbon dioxide

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- A. Organisms living on land get oxygen from the air
- B. Organisms living in water get air from dissolved oxygen or they come to the surface for air
- C. Green plants, algae, and some bacteria need CO_2 gas in addition to O_2
 1. These organisms produce food and oxygen by using photosynthesis
 2. In photosynthesis, green organisms convert the energy from sunlight to energy in food

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Poster of Life

Necessities of Life

1. Food
2. H_2O
3. Habitat
4. Air

Characteristics of Life

1. Cells
2. Grows + Develops
3. Uses Energy
4. Heredity (DNA)
5. Responds to stimuli/change
6. Reproduces

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III A Place to Live (Habitat)

- A. Organisms need a place to live that contains all of the things they need to survive
- B. Organisms compete for food, H_2O , and habitat

IV Food

- A. All Living things need food = energy
- B. Organisms use nutrients from food to replace cells and build body parts

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C. Making Food

- 1. Producers - make their own food
 - a. example: plant

D. Taking Food

- 1. Consumers - organisms that eat other organisms
- 2. Some consumers are decomposers
 - a. Decomposers - organisms that get their food by breaking down nutrients in dead organisms or animal wastes

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V Putting it all together

A. Nutrients are made up molecules

1. Molecules - a substance made when two or more atoms combine

2. Compounds - molecules made of different kinds of atoms

a. Molecules found in living things are usually made of six elements:

^{hydrogen} H, ^{oxygen} O, ^{nitrogen} N, ^{carbon} C, ^{phosphorus} P, ^{sulfur} S

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b these elements combine to form proteins, carbohydrates, lipids, ATP and nucleic acids

VI Proteins

A. Making Proteins

1. Organisms break down the proteins in food to supply their cells with amino acids, those amino acids are then linked together to form new proteins

B. Proteins in Actions

1. proteins have many different functions

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2. Enzymes are proteins that speed up chemical reactions in the cell
3. Protein hemoglobin - inside red blood cells and binds to O_2 and delivers O_2 throughout your body

VII Carbohydrates

A. Molecules are made of sugars called carbohydrates

1. Cells use carbs for energy storage and source of energy

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1. there are two kinds of carbohydrates (carbs)
→ simple carbs + complex carbs

→ simple carbs: made up of one sugar molecule or a few sugars linked together

example: table sugar + sugars in fruits

→ complex carbohydrates: made of hundreds sugar molecules linked together

example: potato

VIII Lipids - compounds that cannot mix with H_2O

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A. Phospholipid: molecules that form much of the cell membrane

1. Cells are mostly H_2O
2. Phospholipids have heads + tails; tails repel H_2O , heads are attracted to H_2O

→ Figure 6 ★
B. Fats + Oils (Lipids)

1. Fat + oils are lipids that store energy
 - a. when organisms use up their carbohydrates they get their energy from their fats + oils

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cellular energy

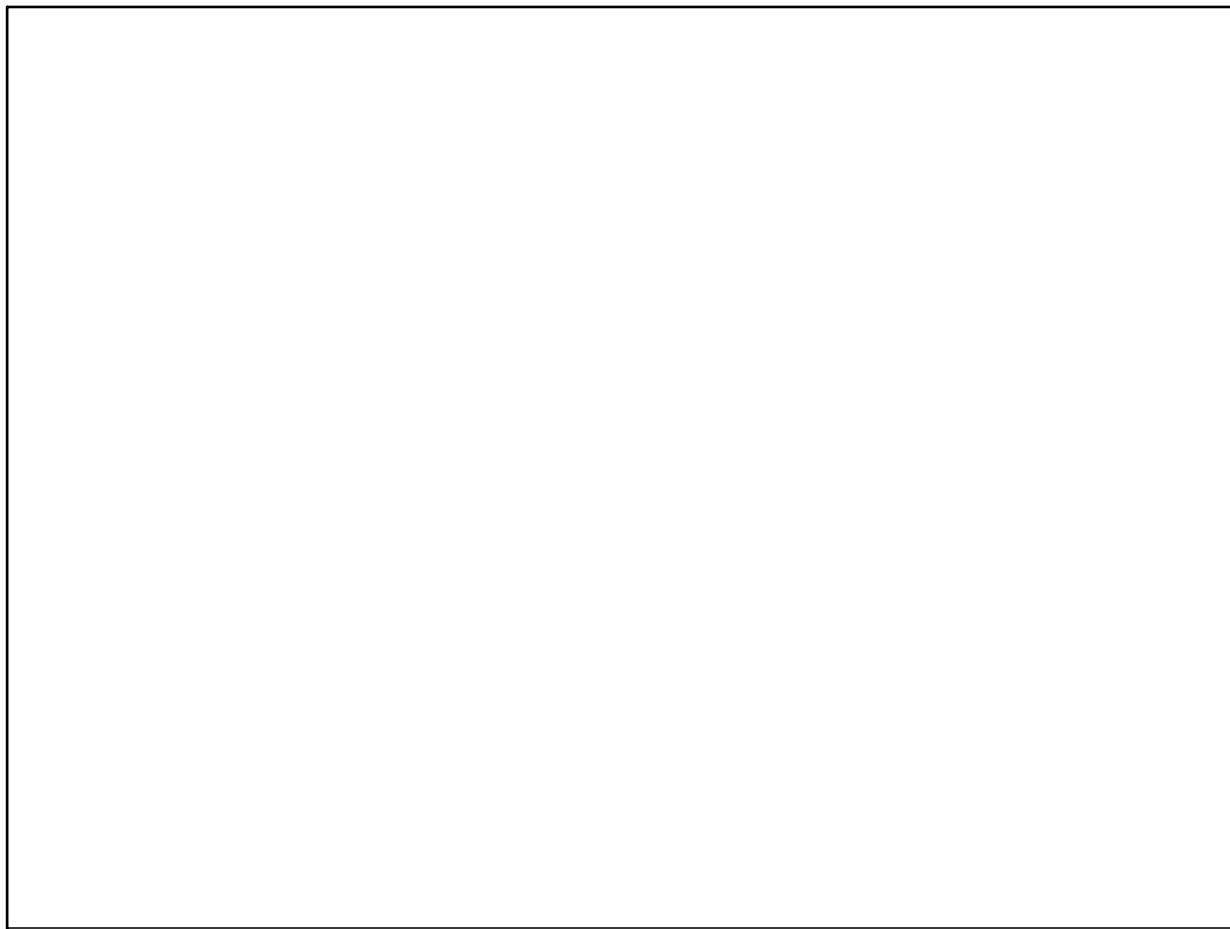
C. ATP (Adenosine Triphosphate)

1. ATP = major energy-carrier molecule in the cell

D. Nucleic Acids

1. The "blueprints of life" because they have the information needed for a cell to make proteins
2. Nucleic Acids are large molecules made up of molecules called nucleotides
 - a. DNA is made up of nucleotides
 - b. how Nucleotides come together and in what order what proteins a cell makes

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